

THE DEBITAGE

Say it in French...and it's more scientific!

The Official Newsletter of the Modoc National Forest Heritage Program

Volume 4, Issue 2

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Special points of interest:

- Student Volunteer program since 1978. Hosting four students in 2014.
- Passport in Time since 1991. Three PIT projects offered in Summer 2014.
- International Volunteer Program inaugurated in 1992.

Also during the FY-14 field season:

- 1,836 volunteer hours were contributed to the Heritage Program.
- MDF crews recorded, re-recorded, updated, monitored or re-flagged 250+ archaeological and historic sites.
- 250+ site records were sent to CSU-Chico for trinomial assignments (including backlog site records).
- Heritage Program Managed to Standard – 55 points!

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2009 Preliminary Rock Art Investigations within Modoc National Forest

By Robert David, PhD

Between August 27th and September 5th, 2009, archaeologists and students from the University of California, Berkeley, and volunteers from the Oregon Archaeological Society visited a number of canyons within Modoc National Forest in an effort to study and document rock art sites (Figure 1). The project was part of my dissertation research, in which I attempt to study rock art sites situated within particular social contexts. Rock art sites located along well-traveled pathways and at commonly used springs, for instance, tend to look much different from rock art located in more private locales, such as deep caves and isolated mountain retreats.



The crew devoted the first few days of the project to surveying the study areas, recording rock art locales, taking preliminary photographs and field notes. Later, we re-visited each site and carried out more complete documentation efforts on specially-designed site forms.

Fig. 1: Melissa Morgan, Dan Braden, Dianne Ness, and MaKai Magie take a break in the shade while recording sites. Photograph by Robert David.

Rock art imagery we encountered ranged from small circular and zigzag figures situated in private, isolated places (Figure 2 – see page 4), to large panels comprised of elaborate concentrations of abstract, zoomorphic, and anthropomorphic figures located in more public settings (Figure 3 – see page. 4). These figures are all stylistically consistent with the Klamath Basin rock art style.

Past researchers have attempted to explain Klamath Basin rock art by affiliating it with Great Basin cultures or even lost “advanced civilizations.” In fact, much of the imagery can be directly associated with powerful beings described in Klamath-Modoc mythology. Although the purpose they served in this region varied from one context to another, many of the images are related to the acquisition and use of supernatural power. The places where these sites are located are believed to be especially concentrated with such power and are thus considered by the Klamath and Modoc to be very sacred. Understanding the varied concentrations of these images between different social contexts helps us to better understand how rock art functioned within the lives of Klamath-Modoc ancestors.

Although we have documented more than twenty sites thus far, we have only scratched the surface insofar as cataloging all the known rock art in this region. More exciting projects are planned for the 2015 and 2016 field seasons.

Using remote sensing for direct detection of archaeological obsidian at Glass Mountain, Modoc National Forest

In this NASA funded project (NASA award NNX13AP66G) Drs. Paul Buck and Don Sabol of the Desert Research Institute in Reno NV (Paul.buck@dri.edu) examine the detectability of sub-pixel artifacts (i.e. site midden, obsidian artifacts, and pottery sherds) using airborne and spaceborne image data. Their objectives are to: 1) use National Aeronautics and Space Administration (NASA-USA) image data in conjunction with actual field/laboratory measured spectra of archaeological materials to test the detection limits of the selected artifact classes at the sub-pixel scale by applying previously demonstrated theoretical detection limit modeling, 2) examine the influence that background, seasonal vegetation change and other on-site changes have for the detectability of these objects in image data, 3) establish the instrumentation, spatial scale, and spectral bands needed to improve the detectability of these objects, and 4) to test predictions of new locations for artifacts at specific (spatial) densities in other image scenes and ground truth these predictions.

One of the locations they are investigating is near Glass Mountain, CA because of the high concentration of obsidian quarries and scatters on the surface. Visible, Short Wave Infrared, and Thermal Infrared spectral characteristics of targets (archaeological material) and background (other non-archaeological materials) are measured in the field and laboratory. A mixture model is then constructed linking these spectra to image data. The success is evaluated by mapping predicted concentrations nearby and conducting ground truthing to determine accuracy.

Field data were collected at the Glass Mountain obsidian site in early June and mid-September 2014; these dates were selected to capture periods of minimal green vegetation and then maximum vegetation at the end of the growing season. Field data collection consisted of: 1) Spectral Data - collection of spectra of relevant target materials and backgrounds, and 2) Spatial Data - collection of data on the density or quantity of materials on the surface of the ground in each of the study areas. One or more extensive generally linear archaeological sites consisting of abundant obsidian is found along the margins of the part of the Glass Mountain flow. We will compare surface densities of artifacts at various places at the site with the same pixels in image data (VIS/NIR, SWIR, thermal etc). The goal is quantify the amount of artifacts in each 8 x 8 m plot and then overlay image data on the same ground area, giving us the artifact proportions within selected image pixels.

SPATIAL DATA. Obsidian artifacts the “targets” of interest at this location are differentially distributed across the Glass Mt. sites. We must estimate the proportion of ground surface covered by these cultural materials, and also the background materials which include soil, rock, live vegetation, dead vegetation, and shade. We defined our analytical unit size as an 8 m x 8 m square. This unit size was chosen because it is approximately the same size as a single “pixel” of some of the image data we have. To estimate the proportion of each 8m x 8m square covered by obsidian, we sampled the site surface using a 50 cm x 50 cm PVC pipe frame (Fig. 1). Each of the 64 1 x 1 m squares of the larger unit were assigned a number from 1-64 then 20 randomly selected for counting (Fig. 2). We took a photo of each square, made a page size print, then took the print into the field and examined on hands and knees each square making a mark on the print for each obsidian artifact. We also took a photo of the entire square by mounting a GoPro camera on a telescoping pole (Fig. 3). Then back in the lab using Photoshop to calculate the area of each individual artifact. We counted fourteen 8x 8 m sample squares combined June and September field sessions. This resulted in counts for 280 of the smaller sample squares (the artifacts were not removed, merely counted while crawling on hands and knees). The range of coverage or “density” is from 0% to 55% coverage.

SPECTRAL DATA. VIS-SWIR and TIR spectra were collected on targets (artifacts) and background. The hand held ASD (Analytical Spectral devices FieldSpec Pro) portable field spectrometer was used for this purpose (Fig. 4). A fiber optic “gun” is pointed at close range to the object and its spectra recorded. Lab thermal spectra will also be collected from non-archaeological obsidian samples derived from the flow. Figure 5 shows spectra of a variety of materials in the VIS-SWIR range, including obsidian (from Glass Mountain), pottery (from the other field site in AZ), background soil, and vegetation and so on.

Fig. 1. Don Sabol counting obsidian artifacts



Future analyses. Image data will be georectified so we can precisely locate our field sites within the images. We will then use the field (VIS-SWIR) and laboratory (TIR) spectra collected from field samples to model the image data using spectral mixture analysis (Adams et al. 1995). This will give us the fractional spatial exposure of the major components in the scene. The resultant fractions will be compared to our field measurements and fractional exposure determined from field photos to determine model accuracy. The second step of image analysis will be to model other areas outside our study sites. The purpose here is two-fold. First, we want to try and find new areas that contain detectable artifacts. Second, we can use the theoretical detection model in conjunction with the fractions of major surface components to create a map that shows where (in image space) the

Remote Sensing (con't.)

background (composed of non-artifact components) is less likely to affect artifact detection. These are areas where artifact detection is most probable and can be used with ancillary data to use remote sensing for increased scrutiny for artifact detection (field checking, inclusion of a new spectral signature of artifact type or condition (i.e. different composition pottery than used in the initial phases of this study).

We have additional field sessions planned for May and September 2015.

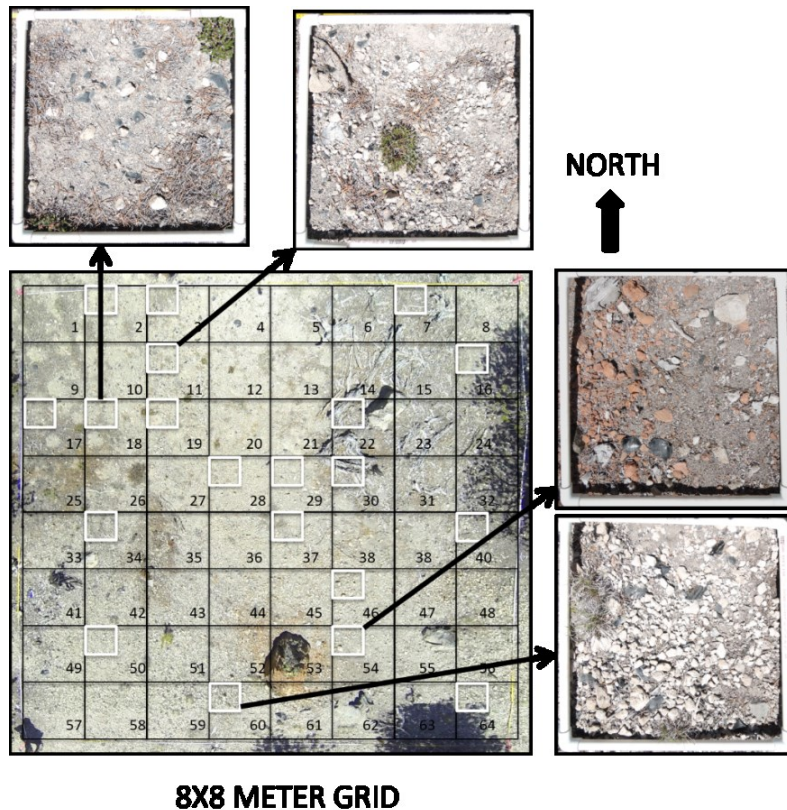


Fig. 2. One of the 8 x 8 sample sites showing the grid and a few of the 20 50 x 50 cm counting units. Taken with the GoPro camera.



Fig 3. Ken Buck holding the telescoping pole with GoPro camera to snap a picture of one of the 8x8 m counting sites.



Fig 4. Using the ASD to collect spectra of obsidian artifacts and background material.

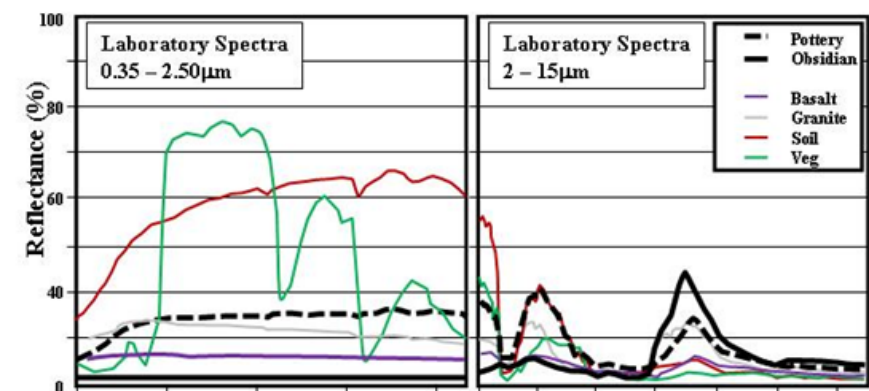


Fig 5. VIS-SWIR (visible short-wave infrared) and TIR (thermal infrared) spectra of obsidian and pottery against typical background materials of rock (basalt, granite), soil, and green vegetation. In the VIS/SWIR obsidian can mimic shade (which is spectrally flat), but in the TIR it has a distinct peak $\sim 9\mu\text{m}$ due to the high silica content. Pottery can look very similar to some rocks in the VIS/SWIR but can exhibit sharp features in the TIR. The detectability of both obsidian and pottery are very dependent upon the spectral contrast with the materials in the background of the scene.

ROCK ART INVESTIGATIONS (Continued from Page 1.)



Fig. 2: Figures located far from prehistoric population centers are thought to represent power symbols resulting from private vision quest rituals.



Fig. 3: Large, elaborate rock art concentrations are likely associated with public ritual and ceremony. *Photographs by Robert David.*

Robert David, PhD, from the University of California at Berkeley, is a Klamath Tribal member. This research is supported in part by the Modoc NF/Heritage.

Volunteers Help Improve High Grade National Recreation Trail

ALTURAS, Calif., Oct. 8, 2014 – Even though the weather was less than perfect, a group of hearty folks celebrated National Public Lands Day, Sept. 27, 2014 with the Modoc National Forest by helping with trail maintenance project on the Warner Mountain Ranger District. Two work parties – comprised of Backcountry Horsemen (BCH) – High Country Unit members, Boy Scouts from Troop 49, and Modoc National Forest employees – spent the day clearing, repairing and improving sections of the High Grade National Recreation Trail (NRT).

Work accomplished on the southern end of the NRT just north of the Buck Creek Fire Station included 0.5 miles of trail improvement and installation of directional signs on the ridge to assist with finding the route along North Star Basin. On the north end, Troop 49 and Scout Masters repaired 0.3 miles of trail. The day ended with lunch at the Fire Station and a tour for the Scouts of the Consolidated Mine area, part of the historic mining district.



Volunteers working on the High Grade NRT.

The 5.5 mile NRT was established in 1980 as a multi-use trail that combines the natural beauty of the northern Warner Mountains with visible history remnants that serve as a reminder of Modoc County's early gold rush and mining heritage. Trail maintenance work has been accomplished with Secure Rural Schools Title II funding. "We appreciate all the hard work that has been done to improve the NRT for forest visitors. This would not have been possible without the help of many partners," commented Amy Hartell, Recreation Officer for the Devil's Garden/Warner Mountain ranger districts. Hartell added, "Thanks to the volunteers!"

This year was the 21st annual National Public Lands Day. The focus of National Public Lands Day is to instill a sense of shared stewardship and educate the public about the importance of natural resources. More than 170,000 volunteers were expected to participate in activities to celebrate National Public Lands Day.

For more information on the High Grade Mining District search for:

PALMER, Kevin A.

1993 *Caveat Emptor: The High Grade Mining District, 1866-1936.* Master's Thesis, Department of History, University of California, Santa Barbara.

This thesis was supported by the Modoc National Forest Heritage Resource Management Program, for field work, site recording, and records research.

Photos from the Modoc NF Historic Photograph Collection...Cows, Cowboys and Rangers 89 years ago!

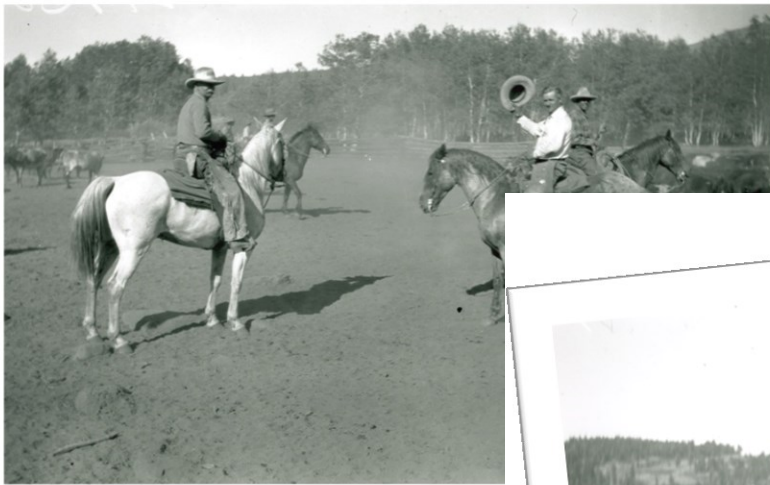


Image No. 217305.

Cowboys or "Buckaroos" rounding up cattle in the South Warners, WMRD, in 1926.

Welcome to Modoc County, *"Where the West Still Lives!"*



Image No. 217269.



Image No. 217270.

A 1926 ranger's camp out on the Devil's Garden, probably out in the Crowder Block of the Devil's Garden RD.

Photos by Oscar L. Barnum, USFS.



Image No. 217283

Modoc NF, Supervisor's Office, Heritage Resource Management, History Archive, Historic Photo Collection.

HERITAGE RESOURCES on the Modoc National Forest: Photo Gallery – A Blast from the Past!



Photo by V. Benté.

Angeles NF District Ranger Mike McIntyre has retired! Here he is at the Van Norman Reservoir in the San Fernando Valley at the site of the historic Lopez Adobe in January 1975. Standing – Greg “Crash” Henton, Joyce Corum, A. George Toren, Vance Benté. Kneeling – Gerry Gates and Michael J. McIntyre...a flamin’ red-haired Irishman! The collapsed dam, from the 1971 earthquake, is in the background

McIntyre was the Forest Archaeologist on Angeles NF for nearly 30 years before becoming a District Ranger.

Happy Retirement Mac!

GATES, Gerald R.

1978 *From Dons to Dams: The Van Norman Reservoir Archaeological Complex, 1972-1975.* Master’s Thesis, Department of Anthropology, California State University, Northridge.



Chris Lauppe, recently retired from the USDA Farm Services Agency, donated this collection of 1960s Smokey memorabilia, formerly held by the Federated Church in Alturas.

The collection will be catalogued and archived in our Heritage Resource Curation Facility. It will be used for future display purposes.

Thank you, Chris and the Federated Church!

REMEMBER to go to www.passportintime to enroll in the Boles Creek Archaeological District VI Passport In Time (PIT) project for 2015!

**Please enjoy, but do not destroy
your American heritage!**

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